

**Steve Dixon**

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**From:** "Wayne Wambold" <wwambold@sehinc.com>  
**To:** <steveo@fnal.gov>  
**Cc:** "Jeff Davis" <jdavis@sehinc.com>; "Kelly Bettendorf" <kbettendorf@sehinc.com>  
**Sent:** Monday, September 26, 2005 3:42 PM  
**Attach:** 69080001.pdf  
**Subject:** NOvA Off Axis Detector

Steve:

The drilling at the Orr-buyck Road site was completed on Thursday Sept. 22nd. I have received field boring logs. They are attached for your reference. The following summarizes the findings for OB1 and OB2. Note that OB1 is approximately 15 feet higher in elevation, based on my interpolation of the USGS contour map for the area.

Granite bedrock was encountered at a depth of 5' at OB1 (approx. el. 1370+/-5) and 15' at OB 2 (approx. el. 1345+/-5). The bedrock surface slopes downward at a grade of roughly 9% from OB1 to OB2. Fifty feet of rock core was obtained at each boring. All cores had 100% recovery and, although we don't have RQD for each core, it is my understanding the RQD is very near 100% as well. The overburden consists of silty sand and sand with silt. Gravel and cobbles were present in the overburden.

A monitoring well was set at OB1. I am not certain whether the true groundwater level will be reflected since the drilling was completed using water. It is likely artificially high until it drains out or is bailed down and allowed to recover. Water was encountered in the overburden at a depth of 10 feet at OB2. This is likely perched on top of the rock; however, will need to be verified during the final investigation.

The packer test was completed at a depth of 40' to 45' in OB2. In the first minute the hole took 10 gallons at a pressure of 30 psi. However, no water entered the formation during the remaining 14 minutes of observation. More of these tests would be prudent once the final site and building elevation is set.

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9/27/2005



ENGINEERING  
TESTING, INC.

## FAX TRANSMISSION

AMERICAN ENGINEERING TESTING, INC.

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To: WAYNE WAMBOLD Date: 9/26/05  
Company: SEH Pages: 6 including this cover sheet  
Fax No.: 651-490-2150 From: PAT FRANCIS  
Phone No.: \_\_\_\_\_ Phone No.: 651-659-1356  
AET Job No. \_\_\_\_\_  
Subject: FIELD LOGS OFF-AXIS SITE  
Comments: Any QUESTIONS, PLEASE CALL

THANKS  
PAT

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ACST14(06/01)



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# SUBSURFACE FIELD BORING LOG

AET JOB NO: 01-2601 LOG OF BORING NO. 2B-1 (P. 1 of 1)

PROJECT: Nova off Aris Detector

DEPTH IN FEET	SURFACE ELEVATION:  MATERIAL DESCRIPTION	GEO	SAMPLE					BLOW COUNTS				
			#	DEPTH	N	MC	TYPE	REC	SET	1 <sup>ST</sup>	2 <sup>ND</sup>	3 <sup>RD</sup>
0-1	Fill mostly silt <del>Clayey sand, fine to med. grained</del> possible cobbles & pebbles - Brown and Dk. Brown		10-212	M	SS	20		1	3	9	10	
1-2	Silty sand, fine to med. grained <del>light brown moist &amp; med. dense (sm)</del>	CA	20-212	M	SS	20		1	3	9	16	
2-3	sand with silt <del>fine to med. grained, moist &amp; very dense (sa-sm/sm)</del>		32-32.8	M	SS	8		9	50/3			
4			41.5-6.5	M	SS	1		50/2				
5.3	Granite -	BR										
E of B55.7												

DEPTH: DRILLING METHOD		WATER LEVEL MEASUREMENTS							Backfill Method: Material
DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN- DEPTH	DRILLING FLUID LEVEL	-WATER LEVEL			
0-5.3	6:45 AM								
5.3-55.7	NG								
BORING START:	1:40 9-19-05								
BORING COMPLETED:	7:45 9-22-05							Lab Log By:	
DR: 55	LG: 56	Rig: 91C						Review By:	

01FLD011(05/04)

## CORING DATA SHEET

JOB NO.

DI-2601

Boring No.

OB-1

By

SS/SG

Coring Machine

Rotary Head

Longyear

Winkie

Penn-drill

Central Mines

Depth of Layer	Depth Cored	Length of Recovery	Per Cent Recovery	Coring Water Ret.	Classification
Fr. 5.3	To 10.7	5.2	100%	100%	
Fr. 10.7	To 15.7	5.0	100%	100%	Formation
Fr. 15.7	To 20.7	4.8	99%	100%	Color: Grey & Pink
Fr. 20.7	To 25.7	5.0	100%	100%	Add. Description: Granite
Fr. 25.7	To 30.7	5.0	100%	100%	Cored with (size "NO" Diamond Set Bit and Double Tube Barrel) (Size NO Wireline System)
Fr. 30.7	To 35.7	5.0	100%	100%	Remarks NO-3
Fr. 35.7	To 40.7	5.0	100%	100%	
Fr. 40.7	To 45.7	5.1	100%	100%	
Fr. 45.7	To 50.7	4.8	99%	100%	
Fr. 50.7	To 51.4	.7	100%	100%	Formation
Fr. 51.4	To 55.7	4.2	99%	100%	Color:
Fr.	To				Add. Description:
Fr.	To				
Fr.	To				Cored with (Size " " Diamond Set Bit and Double Tube Barrel) (Size Wireline System)
Fr.	To				Remarks:
Fr.	To				
Fr.	To				
Fr.	To				Formation
Fr.	To				Color:
Fr.	To				Add. Description:
Fr.	To				
Fr.	To				Cored with (Size " " Diamond Set Bit and Double Tube Barrel) (Size Wireline System)
Fr.	To				Remarks:
Fr.	To				
Fr.	To				
Fr.	To				



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# SUBSURFACE FIELD BORING LOG

AET JOB NO: 01-2601

LOG OF BORING NO. 08-2 (P. 1 of 1)

PROJECT: Nova off Aris Detector

DEPTH IN FEET	SURFACE ELEVATION:  MATERIAL DESCRIPTION	GEO	SAMPLE					BLOW COUNTS					
			#	DEPTH	N	MC	TYPE	REC	SET	1 <sup>ST</sup>	2 <sup>ND</sup>	3 <sup>RD</sup>	4 <sup>TH</sup>
0-2	<del>mostly silty</del> Silty sand, a little gravel Possible cobbles, brown, and black	R	1	0-2	15	M	SS	17	5	9	6	6	
2	Silty sand, a little gravel Fine possible cobbles Fine to med. grained Gray/Brown mottled, moist, and med. dense (5m)	CA	2	2-3	14	M	SS	11	6	7	7		
			3	4-6	38	M	SS	16	8	16	22		
4-0	Silty sand with gravel, fine to med. grained brown, moist, dense to very Dense (5m)	CA	4	7-8	26	M	SS	14	25	43	26		
			5	9-11	44	M	SS	17	18	26	18		
9-0	SAND with silt, with gravel, possible cobbles, fine to med. grained brown, moist, Dense (5m)	CA	6	12-15	38	M	SS	9	12	16	22		
			7	16-16	20	M	SS	6	13	54			
14-0	Silty sand, a little gravel Fine to med. grained, Brown moist, very Dense (5m)	CA											
15-0	<del>End of B-650</del> Granite	BR											
65-0	E o F B												

DEPTH: DRILLING METHOD		WATER LEVEL MEASUREMENTS							Backfill Method: Material
DATE	TIME	SAMPLED DEPTH	CASING DEPTH	CAVE-IN DEPTH	DRILLING FLUID LEVEL	WATER LEVEL			
0-15	4.25 HSA								
0-15 NA casing 15-65 NA	7-20-05	8:09	11.0	9.5	10.5	—	9.8	grouted	
BORING START: 7:25 9-20-05								Portland	
BORING COMPLETED: 12:35 9-21-05								Lab Log By:	
DR: 55 LG: 56 Rig: 91C								Review By:	

01FLD011(05/04)

## CORING DATA SHEET

JOB NO.

01-2601

Boring No.

DB-2

By

SS/SG

Coring Machine

Rotary Head

Longyear

Winkie

Penndrill

Central Mines

Depth  
of  
LayerDepth  
CoredLength  
of  
RecoveryPer  
Cent  
RecoveryCoring  
Water  
Ret.

Classification

Format

Color:

Grey &amp; Pink

Add. Description:

Granite

Cored with (size "NQ" Diamond Set Bit and Double  
Tube Barrel) (Size "NQ" Wireline System)

Remarks

NQ-3

Formation

Color:

Add. Description:

Cored with (Size " " Diamond Set Bit and Double  
Tube Barrel) (Size " " Wireline System)

Remarks:

Formation

Color:

Add. Description:

Cored with (Size " " Diamond Set Bit and Double  
Tube Barrel) (Size " " Wireline System)

Remarks:



Project Now off Axis Detector

By SS/SG

Job No. 01-2601

Date 9-20-05

PACKED TEST NQ

Boring OB-2

DEPTH OF TEST ZONE 40'-45'

DATE	TIME (min)	GALLONS		PSI
		START	END	
	0	595	605	30
	1	605	605	30
	2	605	605	30
	3	605	605	30
2:55	4	605		30
	5			
	6			
	7			
	8			
	9			
	10			
	11			
	12			
	13			
3:05	14		605	30
	15			
	16			
	17			
	18			
	19			
	20			